

There's no 'H' in new-build – or is there?

While there's hardly a rush to use hydrogen heating in new-build homes at present, flagship projects are beginning to emerge across Europe that may build the case for the low-carbon gas, argues **Steven Ashurst**, principal analyst at Delta-EE



Efforts to decarbonise heating in new-build homes is largely focused on installing either electric heat pumps or connections to heat networks.

The option of using low-carbon hydrogen to heat these properties has received little attention thus far, but it could be an interesting option in the future when considering its low NO_x emissions, as well as having no CO₂ output at the point of use.

In Britain, the government's response to its Future Homes Standard consultation and the Scottish Government's New Build Heat Standard consultation have both left the door open to future new-build developments heated with hydrogen. It's a similar situation in countries across Europe – where some nations are already commissioning their first housing developments using hydrogen. But what are their motivations for doing so?

Hydrogen hubs in the Netherlands

The Netherlands, per capita, is the most natural gas-reliant heating market in Europe, with more than 90 per cent Dutch homes being heated with a gas boiler. It is in the process of ending allowing the installation of natural gas connections in new housing developments. This would apply unless these homes can be upgraded to a low-carbon gas supply, either biomethane or hydrogen, in the future.

At the same time as this regulatory shift began, it became clear that the Dutch government wanted to pivot parts of its economy towards hydrogen in a big way, and in the process establish the Netherlands as a European hub of clean hydrogen production. The heating market is not viewed as a prime end-use segment, but some Dutch companies are leading the push for using the gas for such a purpose.

The flagship new build project Nijstad-Oost is in the Hoogeveen municipality and will see 80 new homes connected to a hydrogen supply at the time of construction, around 2022. This will be the first time that for-sale new homes will be fitted with individual H₂ boilers anywhere in the world. A further phase under the wider HYDROGREEN project envisions connecting hundreds more existing homes in the area to the same supply.

Hydrogen neighbourhoods in Germany

Germany has taken a less prescriptive approach when updating its new build regulations. A wider range of technologies can still be installed in new homes, including ones using natural gas. However, the use of hydrogen is also growing in relevance

and importance across the German heating sector.

While the H₂ hub approach is favoured across the Dutch border, the initial activity in Germany has focused on the concept of 'quarters' – neighbourhoods that have a strong emphasis on sustainability.

One very interesting project is in Esslingen, where more than 500 new apartments will make use of hydrogen for heat and power. Meanwhile, a flagship Hydrogen Quarter is being built in Kaisersesch, a few hours west of Frankfurt. The goal is to demonstrate "how renewable energy for heat, electricity and industry can be intelligently coupled with the mobility sector using hydrogen technologies" involving the installation of a H₂ microgrid. Hydrogen supply is due to be up and running from 2023.

Viessmann is the major heating manufacturer involved and is using the project as a proving ground for the pure hydrogen heating appliances it has been developing. It has stated that both condensing boilers and fuel cells fed by hydrogen will be deployed. The company wants to launch its version of a H₂-ready boiler on the German market from 2024, so this project is a vital step in its plans.

What does the future hold?

Britain is at the stage of building demo homes to showcase how hydrogen appliances function and activity is focused on the existing building stock – but not with new housing developments on the scale highlighted above.

I expect that there will be pockets of H₂ heating in new-build, where it makes most sense based on local conditions, but for other technologies to be used far more frequently. However, the extent to which hydrogen is used to heat new homes is not likely to have a make-or-break impact on reaching decarbonisation goals – but in the case of the existing building stock, it just might. This could be the case in the UK, where our housing profile is unique compared to our EU neighbours.

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